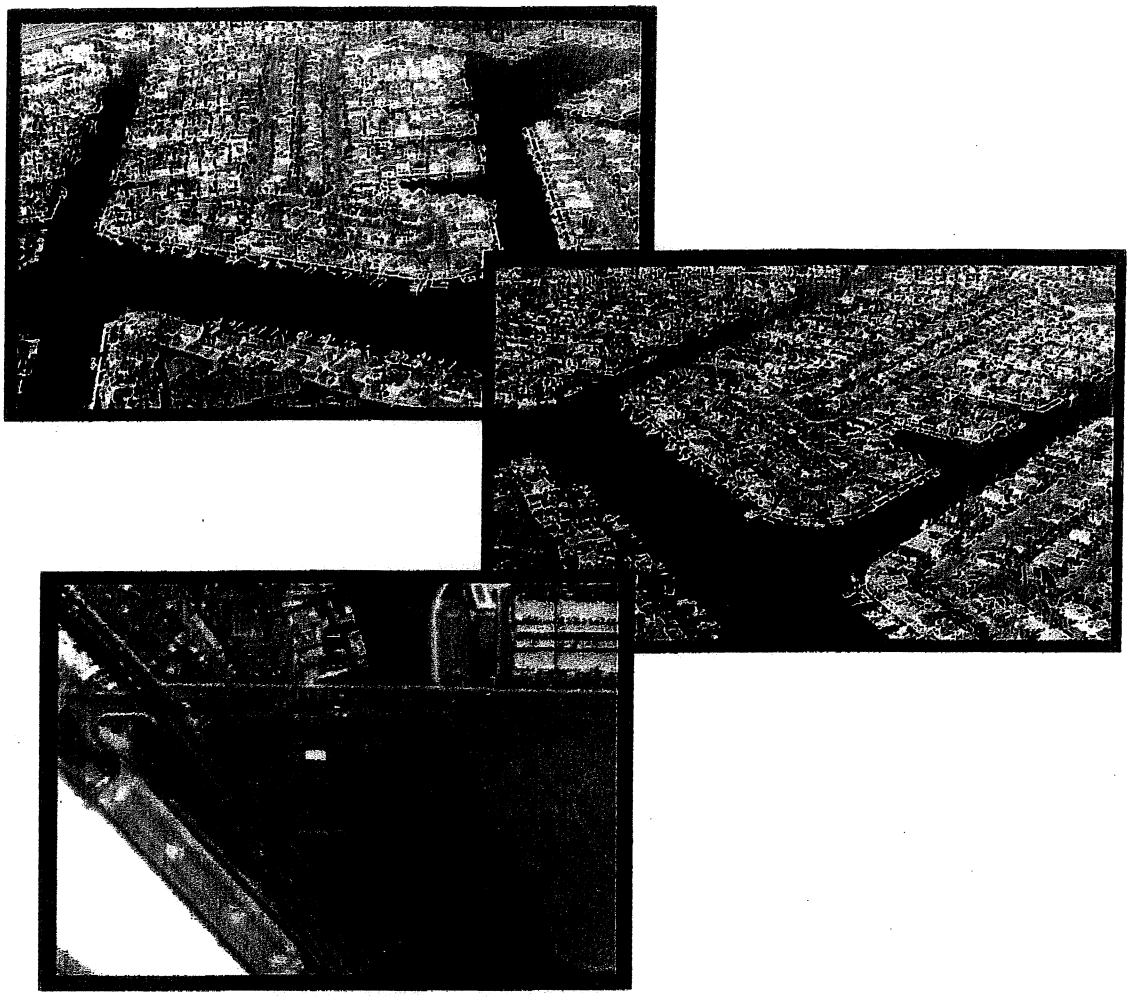
TC 10200
April 2000



Soft Bottom Mitigation Plan

Humboldt Island & Trinidad Island
Bulkhead Repair Project
Huntington Beach, California

Prepared For:
Huntington Harbour Homeowners
Huntington Beach, California

Prepared By:
Tetra Tech, Inc.
670 N. Rosemead Blvd.
Pasadena, California

ATTACHMENT NO. 8.1

Soft Bottom Mitigation Plan

Humboldt Island & Trinidad Island
Bulkhead Repair Project
Huntington Beach, California

April 2000

Prepared For:
Huntington Harbour Homeowners
Huntington Beach, California

Prepared By:
Tetra Tech, Inc.
670 N. Rosemead Blvd.
Pasadena, California

ATTACHMENT NO. 8.2

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

ATTACHMENT NO. ~~8~~ 3

Project Background. Humboldt and Trinidad Islands are man-made islands located in Huntington Harbour, Huntington Beach, California (Figure 1. Vicinity Map). The bulkheads confining these islands are made of reinforced cast-in-place concrete and untreated timber piles support its footing.

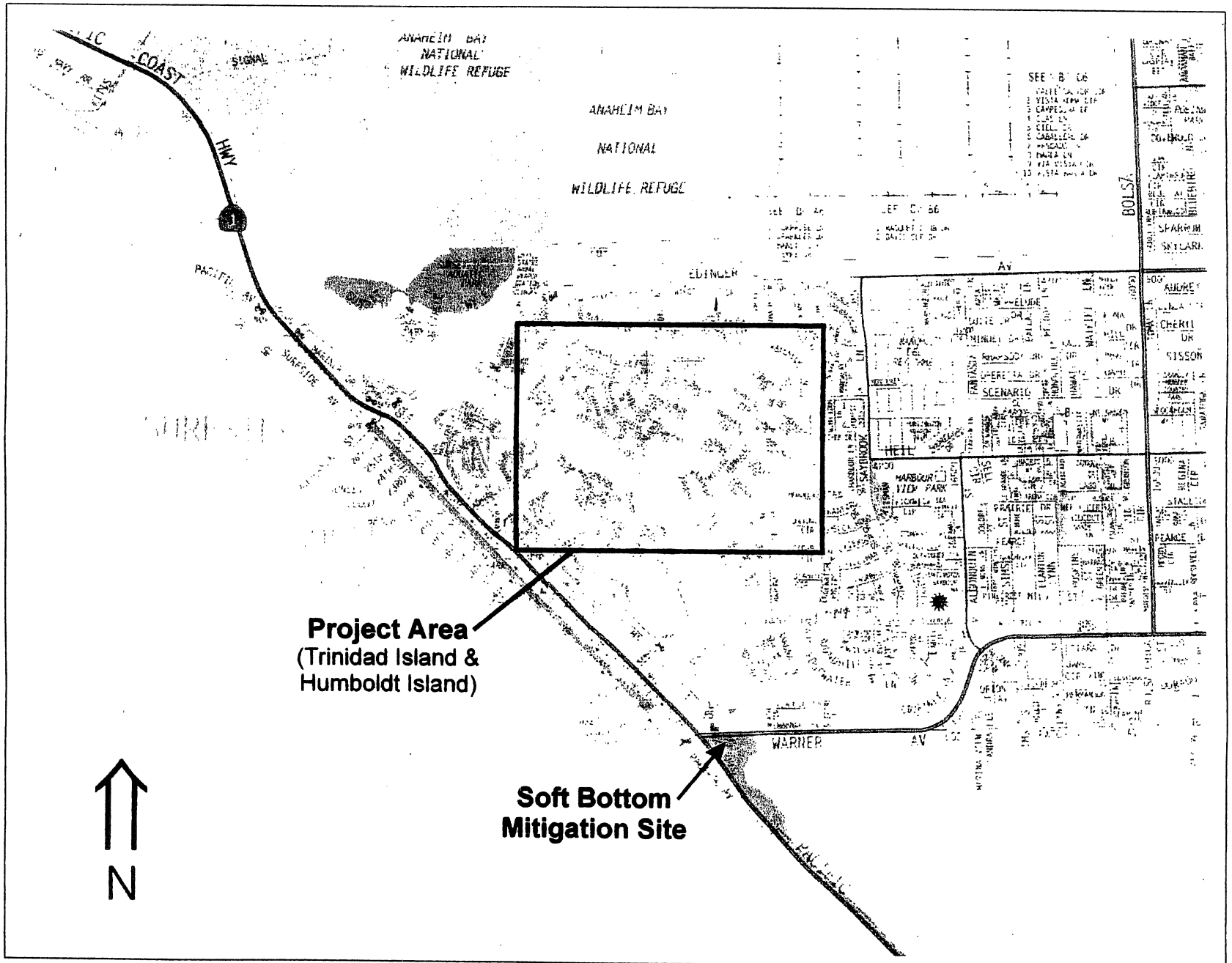
Sediment levels adjacent to the bulkhead have been observed to recede anywhere from one inch, up to three feet below the top of footing in highly dynamic areas. In some areas the loss of these materials has lead to voids extending up to 9.5 feet beneath the bulkhead resulting in the underwater exposure of the supporting piles. In most instances where timber piles have been exposed, marine organisms (such as boring worms) have accessed, and eaten away, the untreated wood causing significant damage in some cases.

The timber piles supporting the footing and bulkhead are the most crucial component of the bulkhead system, maintaining both vertical and lateral stability on the bulkhead. Therefore, the failure of these piles may result in structural instability and consequently the potential catastrophic failure of the bulkhead system containing Humboldt and Trinidad Islands.

For this reason, two groups of homeowners have organized and contracted Tetra Tech, Inc. to assess and mitigate the erosion problem and structural integrity of the bulkheads. Underwater bulkhead inspection surveys were conducted for all participating properties. To date, thirteen Coastal Development Permit Applications representing 39 properties have been submitted by Tetra Tech to the California Coastal Commission for repairs to those properties on Humboldt Island. Two additional properties requiring mitigation on Humboldt Island are being represented by Cash & Associates, Huntington Beach, CA and are included in this mitigation proposal. Two Coastal Development Permit Applications were submitted by Cash & Associates for these properties.

A group of 62 homeowners on Trinidad Island has also contracted Tetra Tech to

ATTACHMENT NO. 8.4



Source: Thomas Bros. Maps

ATTACHMENT NO. 4.5

Tetra Tech
INCORPORATED

Site Vicinity Map
Huntington Harbour Bulkhead Repair
Soft Bottom Mitigation

TC 10200
FIGURE 1

perform bulkhead inspection, repair recommendations, construction oversight, and associated permitting tasks. A single Coastal Development Application is currently being prepared by Tetra Tech for submission to the California Coastal Commission.

The main purpose of the project is to restore the foundation of the bulkhead and provide toe protection to inhibit any future scouring or erosion, which may expose the footing foundation and jeopardize the bulkhead's structural integrity. This work is consistent with Section 30235 of the Coastal Act because its primary purpose is to protect existing structures without causing water stagnation or having any other adverse environmental impact.

The proposed bulkhead repair alternatives have been formulated to minimize potential impact to marine and benthic habitats during construction and as result of construction. In addition to pile repair, there are two basic types of repairs depending on the degree of erosion and damage to the foundation. The properties with nominal erosion will require slope protection only, which consists of the placement of rock in front of the base of the bulkhead at a slope of 2(h) to 1(v).

Properties where voids beneath the bulkhead footing occur will require the installation of sheet pile in addition to the placement of rock slope protection. This aspect of repair consists of placing a PVC sheetpile retaining wall in front of the excavated section of bulkhead. Concrete and grout are then pumped into the excavated area via PVC tubes to fill all voids and thus preclude further exposure of the piles to seawater. The placement of sheet pile will result in unavoidable impact to soft bottom habitat at 22 properties on Humboldt Island and 17 properties on Trinidad Island.

Design drawings for typical bulkhead repairs are presented in Appendix A, and Sheet 2 depicts the various repair alternatives that will be implemented.

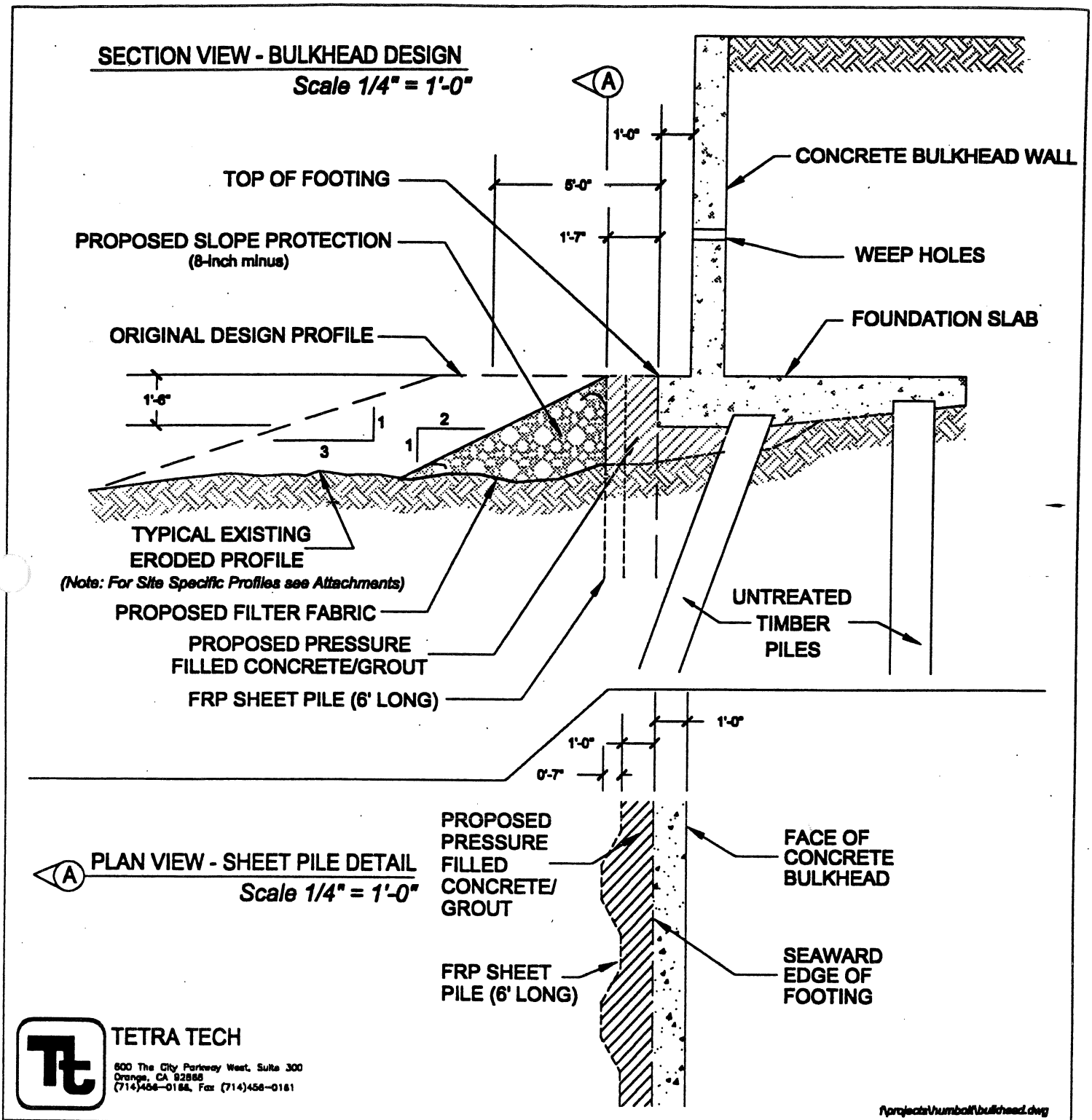
ATTACHMENT NO. 8.b

Huntington Harbour Bulkhead Repair Project Soft Bottom Mitigation Proposal. The City of Huntington Beach has agreed to serve as the lead agency representing the homeowners with regard to mitigation. The purpose of this representation is to consolidate the property owners into one group and to streamline the regulatory review and mitigation implementation. However it is the responsibility of each homeowner for mitigation for loss of soft bottom habitat as a result of the implementation of the Huntington Harbour Bulkhead Repair Projects.

The project participant homeowners must take reasonable and prudent steps to avoid, reduce, or compensate for the loss of soft bottom habitat. Environmentally sensitive bulkhead repair methods and appropriate project timing will reduce the short-term and long-term impacts to soft bottom. Long-term impacts to soft bottom habitat will be mitigated by conducting a soft bottom mitigation project, as described below.

Alternatives to Avoid or Reduce the Loss of Soft Bottom Habitat. The project participant homeowners could avoid or reduce soft bottom habitat loss by (1) not implementing the bulkhead repair program or (2) by reducing the amount of sheet pile placed in front of the bulkhead. The no-action alternative is not feasible and would result in loss of integrity of the bulkheads. To date, Tetra Tech and Cash & Associates have revised the project plans to minimize the amount of sheet pile to be placed in front of the bulkhead and thus reduce as much impact to soft bottom as feasibly possible and at the same time, provide protection to the bulkhead. The impact to soft bottom will also be minimized by installing the sheet pile as close to the bulkhead as possible (Figure 2). Bulkhead Design). The use of sheet pile at some properties has been deemed the least environmentally damaging feasible alternative. This results in long-term unavoidable impact to soft bottom habitat.

ATTACHMENT NO. 8.7



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f\projects\humboll\bulkhead.dwg

PURPOSE: Repair Existing Seawall Datum: MLLW = 0 Adj. Property Owners: 1. See Attached List	FIGURE 2. ORIGINAL BULKHEAD DESIGN Humbolt Island Huntington Beach, CA 92649	Proposed Repair of Existing Seawall Supplemental Info. Report ATTACHMENT NO. 8, 8 California Coastal Commission Date: 3/18/99

Impact to Soft Bottom Habitat. The bulkhead repair configuration shown in Appendix A avoids disturbances to some of the soft bottom along the bulkhead with the exception of soft bottom at 22 properties on Humboldt Island and 17 properties in Trinidad Island. The long-term impact to 1,243 ft^2 on Humboldt Island and 341 ft^2 of soft bottom habitat on Trinidad Island will be unavoidable and require the project participant homeowners to conduct a soft bottom mitigation program (Table 1 & 2, Appendix B). The total area of soft bottom habitat to be impacted at both islands is 1,584 ft^2 (146.8 m^2).

Table 1. Area of impact to soft bottom habitat and proposed mitigation area, based on calculated area of sheet pile to be placed, Humboldt Island, Huntington Beach, California.

Lot Number	Length of Proposed Sheet Pile	Estimated Impact to Soft Bottom			Proposed 2 to 1 Mitigation Area		
	(ft)	(m^2)	(ft^2)	(ha)	(m^2)	(ft^2)	(ha)
126	35	3.4	36.3	0.0003	6.8	72.6	0.0006
129	55	5.3	57.1	0.0005	10.6	114.2	0.0010
130	78	7.5	81.0	0.0008	15.0	162.0	0.0016
131	60	5.8	62.3	0.0006	11.6	124.6	0.0012
133	50	4.8	51.9	0.0005	9.6	103.8	0.0010
136	50	4.8	51.9	0.0005	9.6	103.8	0.0010
137	50	4.8	51.9	0.0005	9.6	103.8	0.0010
138	50	4.8	51.9	0.0005	9.6	103.8	0.0010
139	50	4.8	51.9	0.0005	9.6	103.8	0.0010
140	50	4.8	51.9	0.0005	9.6	103.8	0.0010
141	50	4.8	51.9	0.0005	9.6	103.8	0.0010
142	50	4.8	51.9	0.0005	9.6	103.8	0.0010
143	50	4.8	51.9	0.0005	9.6	103.8	0.0010
144	50	4.8	51.9	0.0005	9.6	103.8	0.0010
145	50	4.8	51.9	0.0005	9.6	103.8	0.0010
147	21	2.0	21.8	0.0002	4.0	43.6	0.0004
149	60	5.8	62.3	0.0006	11.6	124.6	0.0012
150	65	6.3	67.5	0.0006	12.6	135.0	0.0012
151	75	7.2	77.9	0.0007	14.4	155.8	0.0014
170*	18	1.7	18.7	0.0002	3.4	37.4	0.0004
134**	50	6.0	64.6	0.0006	12.0	129.2	0.0012
158**	95	11.4	122.7	0.0011	22.8	245.4	0.0022
Total	1162.0	115.2	1243.1	0.0117	230.4	2486.2	0.0234

On Trinidad Island the construction of the bulkhead is such that there is overspilled concrete in front of the footing in many places. Where this overspill occurs the cutoff wall is comprised of uneven concrete poured in place at the time of construction. In these cases the toe of the cutoff wall did not have a form in place and concrete spilled seaward through the bottom of the cutoff wall resulting in an irregular slab ranging in thickness. This slab of overspilled

ATTACHMENT NO. 8-7

concrete extends seaward up to three feet. Thus the soft bottom area within the proposed sheet pile footprint has been considerably reduced (Appendix C).

Table 2. Estimated maximum impact to soft bottom habitat and proposed mitigation, based on calculated area of sheet pile to be placed, Trinidad Island, Huntington Beach, California.

Lot Number	Length of Proposed Sheet Pile	Estimated Impact to Soft Bottom			Proposed 2 to 1 Mitigation Area		
	(ft)	(m^2)	(ft^2)	(ha)	(m^2)	(ft^2)	(ha)
8636-10	60	4.6	49.8	0.0005	9.2	99.6	0.0010
8636-12	42	2.9	31.1	0.0003	5.8	62.2	0.0006
8636-13	38	0.1	1.0	0.0000	0.2	2.0	0.0000
8636-23	25	2.1	22.8	0.0002	4.2	45.6	0.0004
9168-31	16	1.5	16.6	0.0002	3.0	33.2	0.0004
9168-41	8	0.3	3.1	0.0000	0.6	6.2	0.0000
9168-64	51	4.9	53.0	0.0005	9.8	106.0	0.0010
9168-69	15	1.4	15.6	0.0001	2.8	31.2	0.0002
9168-70	14	1.3	14.5	0.0001	2.6	29.0	0.0002
9335-44	3	0.3	3.1	0.0000	0.6	6.2	0.0000
9335-46	6	0.6	6.2	0.0001	1.2	12.4	0.0002
9347-72	12	1.2	12.5	0.0001	2.4	25.0	0.0002
9347-73	35	2.3	24.9	0.0002	4.6	49.8	0.0004
9347-74	67	6	64.4	0.0006	12.0	128.8	0.0012
9347-79	10	0.3	3.1	0.0000	0.6	6.2	0.0000
9347-81	18	0.7	7.3	0.0001	1.4	14.6	0.0002
9347-82	23	1.1	11.4	0.0001	2.2	22.8	0.0002
Total	443.0	31.6	340.4	0.0031	63.2	680.8	0.0062

Compensation for the Loss of Soft Bottom Habitat. An alternative for mitigation of this loss of soft bottom habitat has been presented by the California Department of Fish & Game. This soft bottom mitigation and monitoring program is provided below.

A mitigation program for the loss of soft bottom involves several tasks; (1) selecting a potential soft bottom mitigation site, (2) obtain required permits, (3) obtain a contract for this project from California Department of Fish & Game, (4) conducting the mitigation project, (5) conducting mitigation monitoring surveys to evaluate the level of mitigation success, and (6) if required, conducting remedial mitigation work if the primary project does not meet project success criteria.

ATTACHMENT NO. 8-10

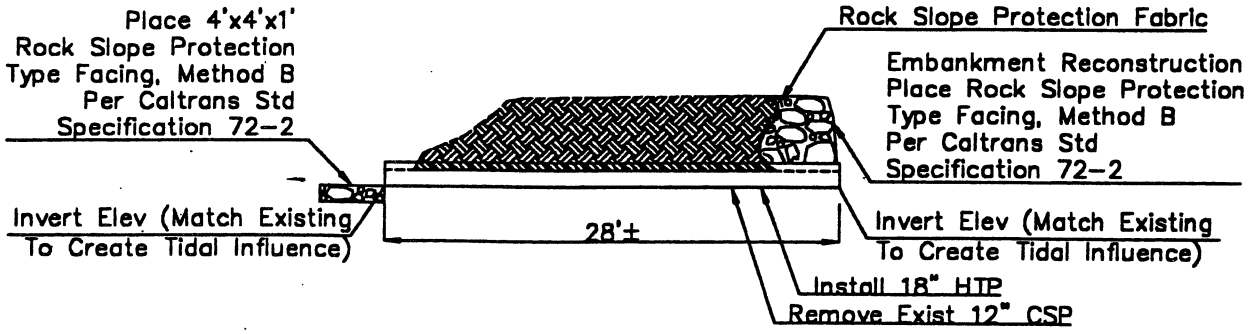
Mitigation Site Selection. The proposed mitigation site is adjacent to and connected to Huntington Harbour. The proposed location of the soft bottom mitigation is in the Bolsa Chica Ecological Reserve adjacent to Huntington Harbour between 0.5 to 1.2 miles southwest of the impact area properties (Figure 1). This property is owned and managed by the California Department of Fish & Game. The area is in Bolsa Chica Ecological Reserve, which is connected to Huntington Harbour by a channel at Warner Avenue. Photographs of the proposed mitigation area are presented in Appendix D.

There is an existing wetland area adjacent to the southeast corner of Pacific Coast Highway and Warner Avenue which is fed by a 12-inch diameter conduit, that is 28-ft in length, connecting the wetland area to the channel at the east end (Figure 3. Conduit Detail). This entrance conduit has corroded and broken, resulting in impedance of proper tidal flushing of the wetland. In addition, in the adjacent area located immediately south of the west end of this wetland area, there is a concrete foundation which is from a former structure that was removed decades ago. This concrete and the associated debris are occupying space that could otherwise function as wetland.

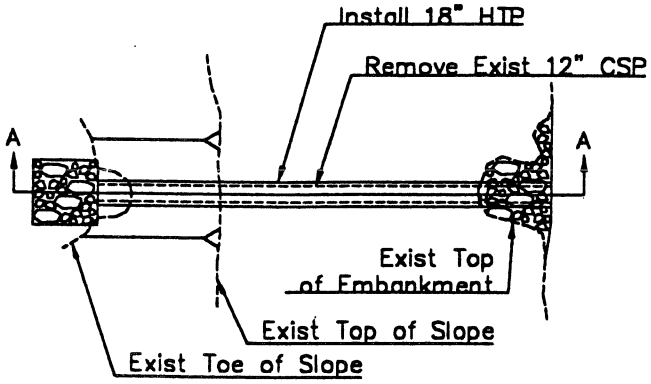
The soft bottom mitigation will involve several steps; repair of existing conduit, removal of concrete debris, regrading the mitigation area to elevations similar to the adjacent wetland area (between +1-ft MLLW and +5-ft MLLW), followed up with monitoring surveys, and evaluating the success of the mitigation.

Conduit Restoration. Replace existing conduit with 18-inch diameter PVC conduit 28 feet in length. Install rip-rap around new conduit. Restore embankment where it has eroded to previous dimensions aligned with the surrounding channel embankment. The restoration of this conduit will create a tidal influence in the existing wetland area (Figure 3. Conduit Detail).

ATTACHMENT NO. 8-11



Section A–A



Plan

ATTACHMENT NO. 8.12

cad/l/projects/e501/e501-debris.dwg

TETRA TECH, INC. 670 North Rosemead Blvd. Pasadena, California 91107	Conduit Detail Humboldt/Trinidad Mitigation Bolsa Chica Ecological Reserve	**FIGURE 3**
Date: 3/14/00		TC E-501

Concrete Debris Removal. Remove concrete structure and associated debris including concrete, bricks, and a steel bollard. An estimated quantity of 60 to 90 cubic yards of concrete and brick debris would be removed. In addition dead iceplant and shrubs will be removed from the area. The embankment alongside Pacific Coast Highway will not be disturbed within 15 feet of the edge of the asphalt. The portion of the concrete structure within 15 feet of Pacific Coast Highway will be protected in place (Figure 4. Concrete Removal Plan). Heavy equipment used for concrete removal will be staged on the asphalt of Pacific Coast Highway immediately adjacent to the project area.

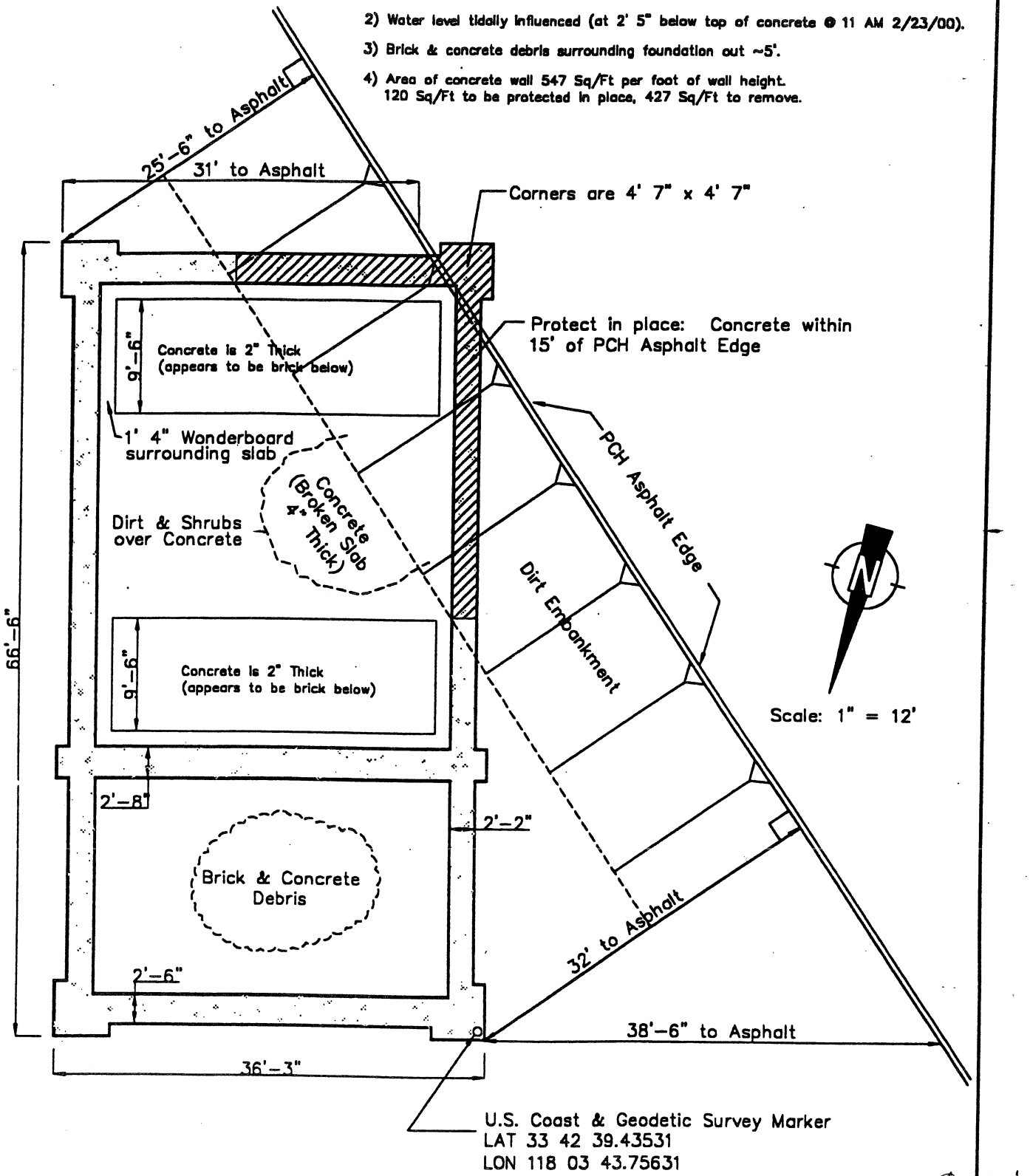
Regrading of Area. In order to restore the area to wetlands it will be regraded to elevations matching the functioning wetland area immediately to the north (Figure 5. Regrading Plan). Elevations in the functioning wetland area are between +1-ft and +5-ft MLLW. The area to be regraded is 3,410 ft^2, which results in a mitigation ratio of 2.15 to 1, as the total impact to soft bottom is 1,584 ft2.

In all phases of this project Best Management Practices will be implemented in order to minimize impact to the surrounding area. Pickleweed within the project area will be carefully salvaged and transplanted if possible. Any pickleweed impacted as a result of this project will be replaced using pickleweed plant material from the adjacent area or brought in from a nursery. This aspect will be performed under the direction of Fish & Game personnel. The California Department of Fish & Game will be notified prior to any on-site action taken regarding this project.

ATTACHMENT NO. 8-13

NOTES:

1) Concrete wall at least 3' in height.
2) Water level tidally influenced (at 2' 5" below top of concrete @ 11 AM 2/23/00).
3) Brick & concrete debris surrounding foundation out ~5'.
4) Area of concrete wall 547 Sq/Ft per foot of wall height.
   120 Sq/Ft to be protected in place, 427 Sq/Ft to remove.



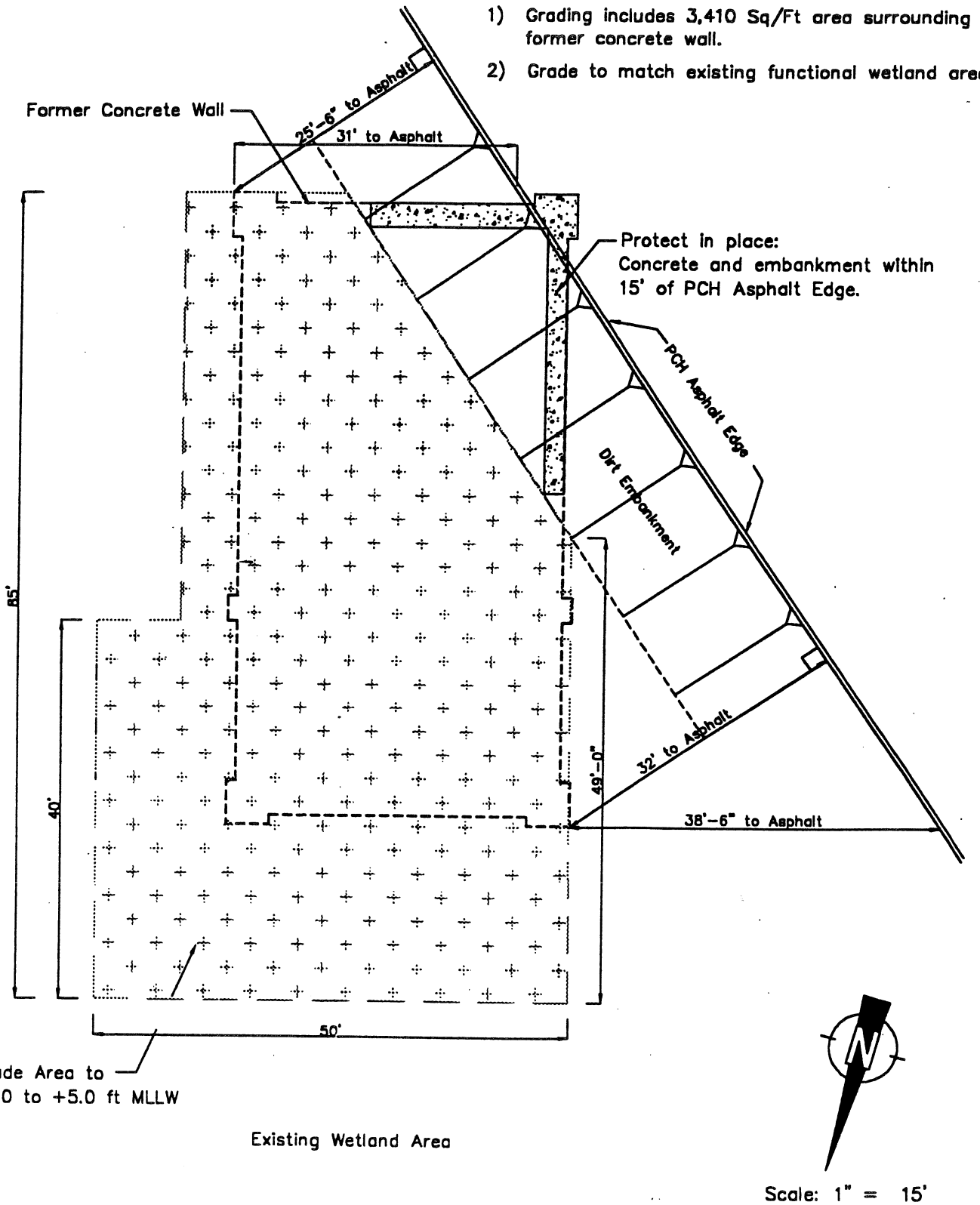
cad/f/projects/e501/e501-debris.dwg

ATTACHMENT NO. 8, 14

TETRA TECH, INC. 670 North Rosemead Blvd. Pasadena, California 91107	Concrete Debris Removal Humboldt/Trinidad Mitigation Bolsa Chica Ecological Reserve	**FIGURE 4**
Date: 2/25/00		TC E-501

NOTES:

1) Grading includes 3,410 Sq/Ft area surrounding former concrete wall.
2) Grade to match existing functional wetland area.



Scale: 1" = 15'

ATTACHMENT NO. 8.16

cad/f/projects/e501/e501-grade.dwg

TETRA TECH, INC. 670 North Rosemead Blvd. Pasadena, California 91107	Wetland Improvement Plan Humboldt/Trinidad Mitigation Bolsa Chica Ecological Reserve	**FIGURE 5**
Date: 2/25/00		TC E-501

Mitigation Project Timing. The mitigation project will be conducted concurrent to the bulkhead repair project. It is proposed to conduct this project in spring or summer 2000. If the soft bottom mitigation timing is not compatible with the project schedule, then resource agencies will be consulted to determine if mitigation should be increased due to delays.

Field Monitoring and Mitigation Evaluation. Immediately following construction, grades at the mitigation site will be verified by Tetra Tech to ensure that they meet design specifications. In addition the tidal velocity at the entrance conduit will be assessed to determine if flow is acceptable or needs to be increased or decreased. A series of five (5) monitoring surveys will be required to evaluate mitigation project success. Post-mitigation monitoring surveys will be conducted annually for a period of five years to determine the elevations of the graded area and acceptable tidal flow through the entrance conduit.

Annually during the five-year monitoring period, Tetra Tech will spot-check elevations at several locations within the mitigation site to determine any elevation changes. Tetra Tech will also measure water levels at various points and tidal velocities at the entrance conduit in conjunction with the topographic monitoring surveys.

Criteria for Remedial Work. The regraded mitigation area should maintain grade within plus or minus 1-ft. The regraded area to serve as wetland should be inundated at a tide of +5-ft MLLW or greater. The flow at the entrance conduit should be such that this inundation can occur. If elevation criteria are not met, then remedial work will be conducted to bring elevations within the +1-ft to 5-ft MLLW range. If flow rate criteria are not met the flow will require appropriate adjustment.

Maintenance. The monitoring contractor will perform maintenance tasks annually when results of the monitoring reveal elements of the project that do not meet the mitigation goals. These maintenance tasks may include, but are not

ATTACHMENT NO. 8, 16

limited to, regrading areas of the mitigation site which do not maintain an acceptable grade and adjust the flow at the entrance conduit to provide proper tidal influence. Following any maintenance work, the contractor will submit a brief report describing the work completed. The contractor will also confer with the California Department of Fish & Game on aspects that relate to excessive erosion, sedimentation, or problems with the entrance conduit.

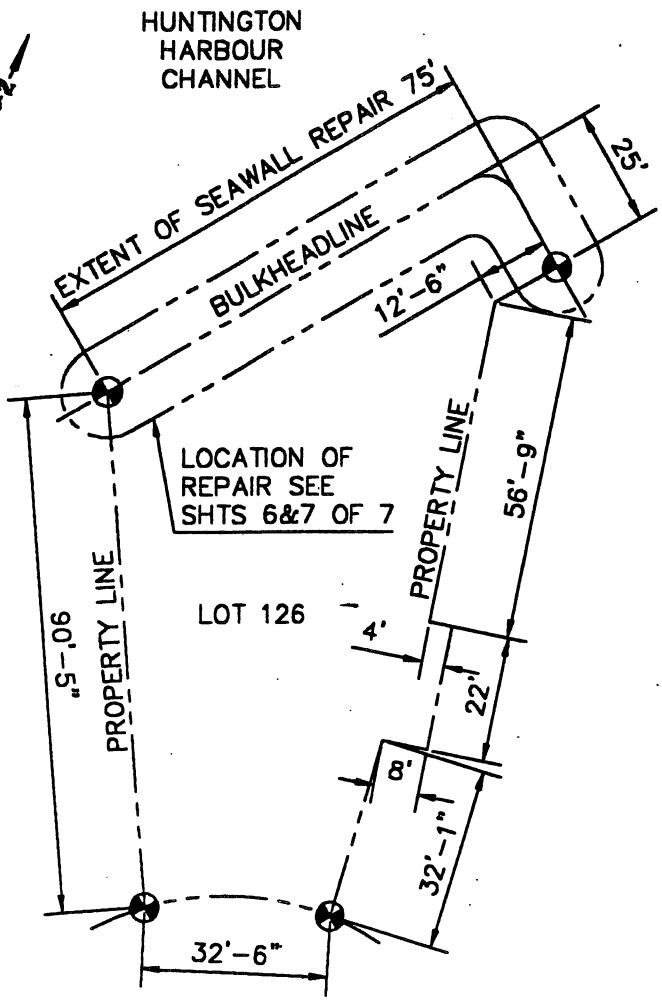
Reporting. Field survey results will be submitted to the California Department of Fish & Game, California Coastal Commission and other relevant resource agencies in report format within 30 days of each of the surveys. The reports will present elevation and tide levels along with an assessment of the functional quality of the entrance conduit and recommended remedial measures if the mitigation project is not meeting mitigation success criteria.

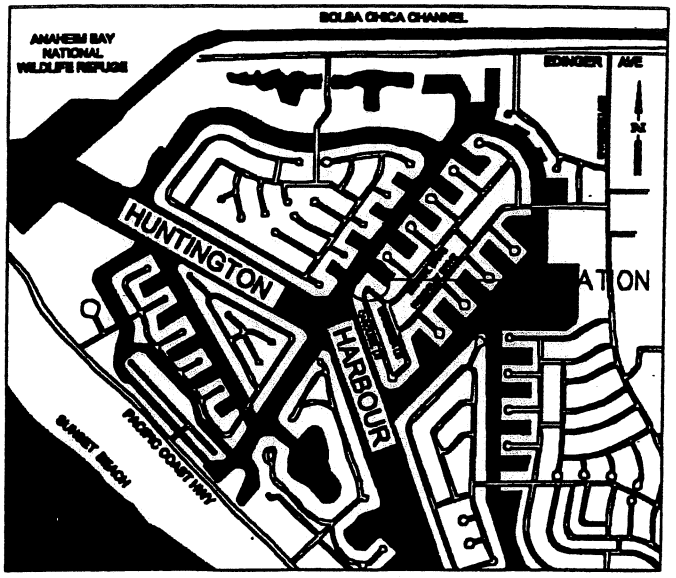
ATTACHMENT NO. 8.12

APPENDIX A

Bulkhead Repair Project Drawings

ATTACHMENT NO. 8.18





VICINITY MAP

FROM U.S.G.S. SEAL BEACH
QUADRANGLE CALIFORNIA
SCALE 1:24000

NOTE:
ALL DEPTHS BASED ON
MLLW=0.00 FT.

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ATTACHMENT NO. 8.19

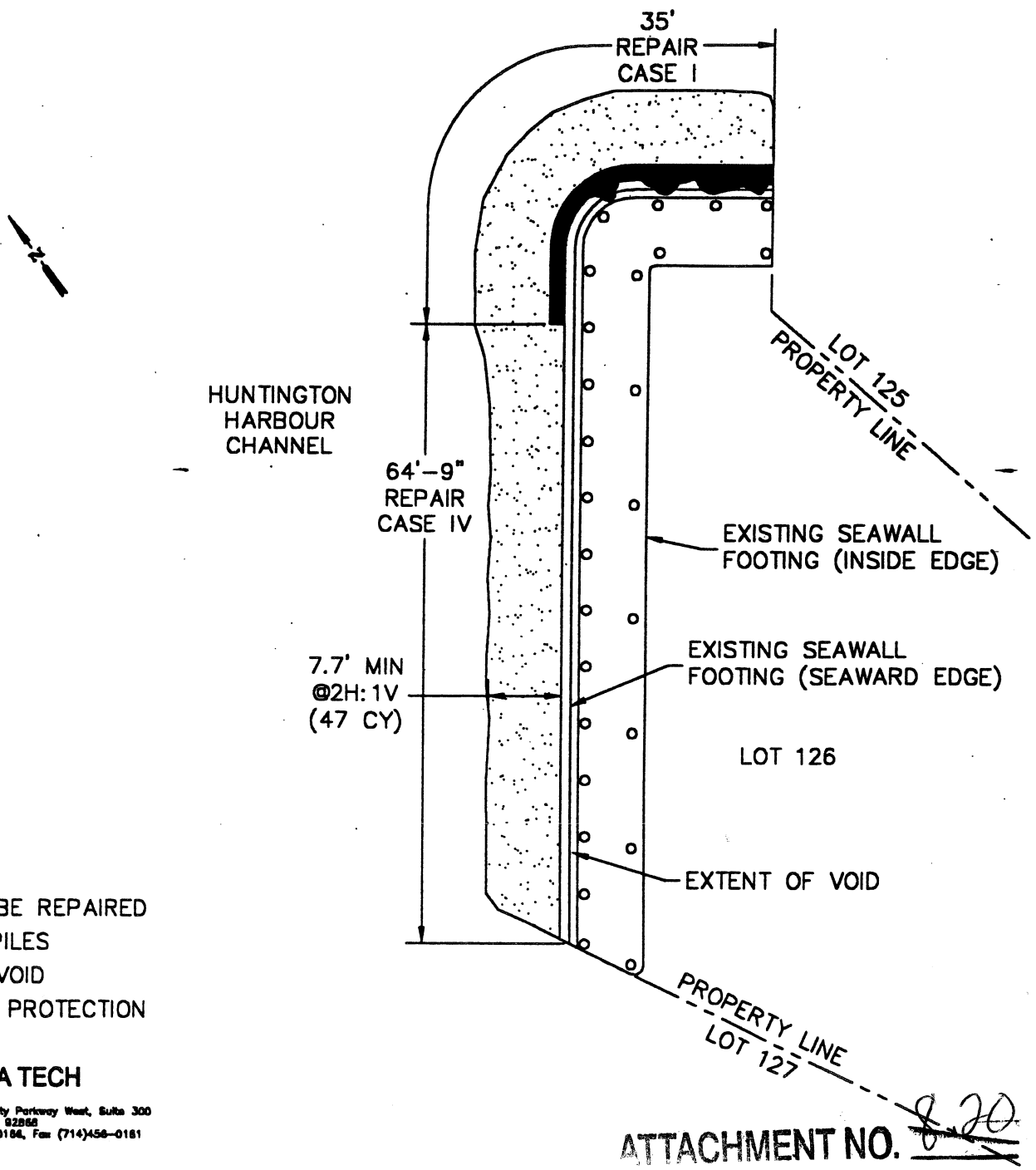
PURPOSE: Repair Existing Seawall

Datum: MLLW = 0
Adj. Property Owners:
1. See Attached List
2.
3.

PLAN VIEW
0 32 64
1" = 32'

Proposed Repair of Existing Seawall

IN: Huntington Harbour
AT: Huntington Beach
County of Orange State: CA
Application By: Resident
Sheet 1 of 7 Date: 2/25/99



LEGEND:

- ● PILES TO BE REPAIRED
- ○ EXISTING PILES
- ▩ GROUTED VOID
- ⊡ ROCK TOE PROTECTION

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ATTACHMENT NO. 8 20

PURPOSE: Repair Existing Seawall

Datum: MLLW = 0
Adj. Property Owners:
1. See Attached List
2.
3.

PLAN VIEW
0 10 20
1/16" = 1'- 0"

Proposed Repair of Existing Seawall

IN: Huntington Harbour
AT: Huntington Beach
County of O.C. State: CA
Application By: Resident
Sheet 2 of 7 Date: 2/25/99

1. GENERAL CONDITIONS & EXISTING CONSTRUCTION: Contractor shall verify the existing conditions shown on the drawings prior to installation of the work and shall notify the owner immediately of any discrepancies between the as-built conditions and the conditions shown on the drawings

   Dimensions to the existing construction shown on the drawings are for information and estimating purposes only. Contractor is responsible for field verification of all dimensions relating to the existing construction prior to the installation of the work. Existing construction shall not be drilled, cut, or altered in any way except as specifically shown on the drawings. Contractor shall protect the existing construction from damage during the installation of the work shown.Contractor shall be responsible for the repair of any damage to the existing construction which may occur during the installation of the work, and shall restore any damaged area, at his expense, to its original condition.

   It shall be the contractors responsibility to obtain and pay for all necessary permits and approvals prior to commencement of the work. The contractor shall comply with all applicable requirements of the State Safety Orders and OSHA, and all work shall conform to the applicable requirements of the current edition of the Uniform Building Code (UBC).

   Contractor shall supply, transport to the site, and install all items required for completion of the work shown in accordance with the drawings and the manufacturers written recommendations.

2. MONITORING & CONTINGENCY PLAN: The Contractor shall establish monuments and/or measure cracks to monitor any movement. Crack control monitoring devices (minimum 3) will be installed by the contractor @ locations selected by the Engineer. These devices will be monitored by the contractor daily. If movement is detected contractor will immediately inform the Engineer. In the case where more than one adjacent pile are completely eroded, the Contractor shall re-evaluate the condition of the adjacent piles to ensure the safety of the divers and shall contact the Engineer if deemed prudent. In the case where the wall exhibits fracture across its section, and where displacement is evident, and/or support piles have failed, the Contractor shall implement contingency plans as approved by the Engineer. As a contingency plan, The Contractor shall have two(2) chance anchors, model #C110-0235 SS175 with enough rod extensions to install a 30ft long earth anchor. All equipment needed for "CHANCE" anchor installation shall be onsite with accompanying certifications that equipment gages have been properly calibrated.

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ATTACHMENT NO. 8 3H

PURPOSE: Repair Existing Seawall Datum: MLLW = 0 Adj. Property Owners: 1. See Attached List 2. 3.	SPECIFICATIONS	Proposed Repair of Existing Seawall IN: Huntington Harbour AT: Huntington Beach County of O.C. State: CA Application By: Resident Sheet 3 of 7 Date: 2/25/99

3. MISCELLANEOUS MATERIALS: Expansion anchors shall be Kwik Bolt II by Hilti Corporation or approved equal. Provide anchors made of Type 316 stainless steel and provided with rod couplings.

Threaded rod shall be Type 316 stainless steel threaded rod. Provide rod with thread spacing and of diameter to match rod coupling provided with expansion anchors and with nut and washer at one end.

Provide continuous wales of size indicated on the drawings and fabricated from number 1 grade Douglas fir. Wales shall be cut and drilled and then coated with polyurethane base coat Elasto-Deck 5001 and top coated with Elasto-Glaze 6001 AL, by Pacific Polymers. Apply and touch up damaged areas of wood coatings in accordance with the manufacturers written instructions.

Jacks shall be McMaster-Carr bell base screw jack model no. 2926T20 or approved equal. Jack capacity shall be 30 tons or greater.

4. HIGH PRESSURE GROUT: Provide MasterBuilder 212 grout, mixed and placed in accordance with manufacturers written instructions. After concrete has hardened place grout at recommended pressure through 1 1/2" diameter schedule 40 PVC grout tubes to fill remaining voids. Grout tubes shall be placed as shown on the drawings where the foundation base slab has been undermined and pile repair is required. Placement of grout shall continue at one location until grout exits grout tubes at adjacent pile repair locations. If adjacent pile locations do not require pile repair, two grout tubes shall be installed and grout shall be placed through one tube until it begins exiting the second tube. Elevation of feed ends of grout tubes shall be maintained above maximum high water level and grout shall be placed to the top of the tube, until grout has hardened.

5. PORTLAND CEMENT CONCRETE: Provide normal weight concrete to fill beneath the foundation base slab with the following properties:

Minimum ultimate compressive strength of 3,000 psi at 28 days.
Portland Cement: ASTM C150, Type V
Aggregate : ASTM C33 (Coarse Aggregate shall conform to requirements of Size #8, Table 2)
Water: Potable
Slump: 7 inches

Materials shall be mixed, transported, fabricated, placed, consolidated, and finished in accordance with the requirements of the current edition of the American Concrete Institute Building Code Requirements for Reinforced Concrete (ACI 318) and (ACI 304R). Specifically, concrete placement shall conform to the requirements of Chapter 8 "Concrete Placed Under Water", utilizing either the direct pumping or tremie methods. Contractor shall take care to maintain the end of the pipe or tremie in the concrete mass at all times during concrete placement.

TETRA TECH
600 The City Parkway West, Suite 300
Orange, CA 92868
(714)456-0184, Fax (714)456-0181

ATTACHMENT NO. 8-22

PURPOSE: Repair Existing Seawall Datum: MLLW = 0 Adj. Property Owners: 1. See Attached List 2. 3.	SPECIFICATIONS	Proposed Repair of Existing Seawall IN: Huntington Harbour AT: Huntington Beach County of O.C. State: CA Application By: Resident Sheet 4 of 7 Date: 2/25/99

6. STEEL PLATES & PIPE: Structural steel plates shall conform to the requirements of ASTM A36. Steel pipe shall conform to the requirements of ASTM A53 Type B. All welding shall be performed by welders certified to perform the indicated types of welding and shall be in accordance with the current edition of the American welding Society (AWS) Structural Welding Code for steel. L.A. welding certificates shall be provided.

7. SHEET PILING: Shall be Shore Guard Rigid Vinyl Sheet pilling by Materials International, Atlanta, Georgia 800–256–8857. Provide size shown on drawings and install in accordance with manufacturers written instructions.

8. CONSTRUCTION SEQUENCE: Construction shall be completed and inspected in accordance with the following:

1. Prior to start of construction, a diver certified to operate in the state of California will inspect the existing foundation and piles and determine repair requirements.

2. When pile repair is required, no more than one pile shall be cut and the jack assembly installed prior to beginning work on the next pile. Upon completion of jack assembly installation, grout tubes shall be hung from the bottom of the base slab. After placement of jack assembly, jack shall be adjusted to its maximum capacity, but not greater than 20 tons. Jack adjustment shall be completed during high tide. Prior to concrete placement, pile repair work and jack assembly installation shall be inspected and approved.

3. Upon completion of all pile repair and jack assembly installation work at a given property, vinyl sheet piling, tie–backs, and wales shall be installed. Prior to installation of first sheet pile, notify John Von Holle of the Huntington Beach Public Works Department @ (714) 536–5431.

4. After installation of sheet piling, tie–backs, and wales is completed at a given property, placement of concrete fill shall be completed in accordance with the drawings and these notes.

5. After concrete has cured for a minimum of 48 hours, all remaining voids shall be filled with grout in accordance with the these notes and the grout manufacturers written instructions. After completion of concrete and grout placement is complete, work shall be inspected and approved.

6. Contractor shall locate all existing weep holes in bulkhead walls, remove marine growth and clean out weep holes from the water side to the earth side of the wall.

In order to avoid construction delays, contractor shall coordinate activities and schedule diver inspections. Divers shall be certified and approved by Tetra Tech. Contact Fernando Pages, (Tetra Tech, Inc.) @ (626) 351–4664.

TETRA TECH
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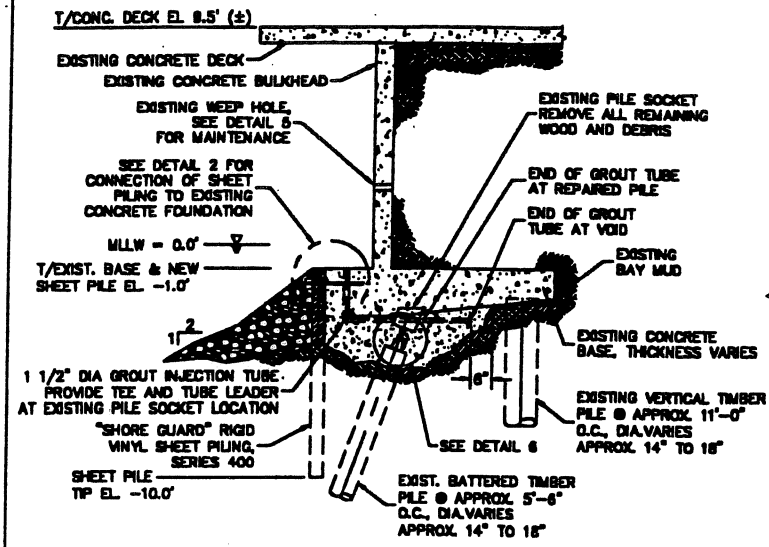
(714)456–0164, Fax (714)456–0161

ATTACHMENT NO. 8, 23

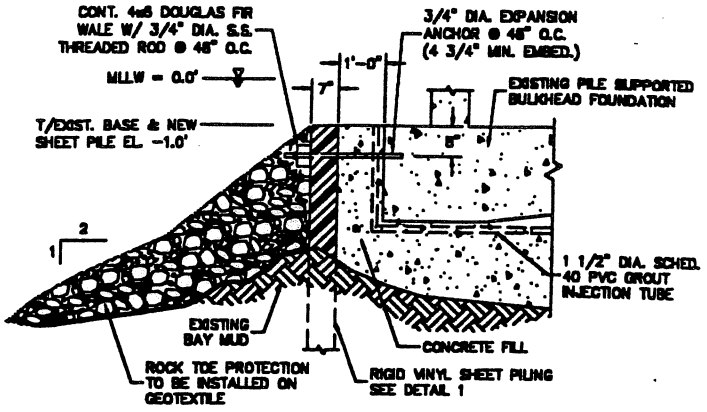
PURPOSE: Repair Existing Seawall	SPECIFICATIONS	Proposed Repair of Existing Seawall
Datum: MLLW = 0 Adj. Property Owners: 1. See Attached List 2. 3.		IN: Huntington Harbour AT: Huntington Beach County of O.C. State: CA Application By: Resident Sheet 5 of 7 Date: 2/25/99



SECTION AT TIMBER PILE REPAIR

SCALE: 1/8" = 1'- 0"

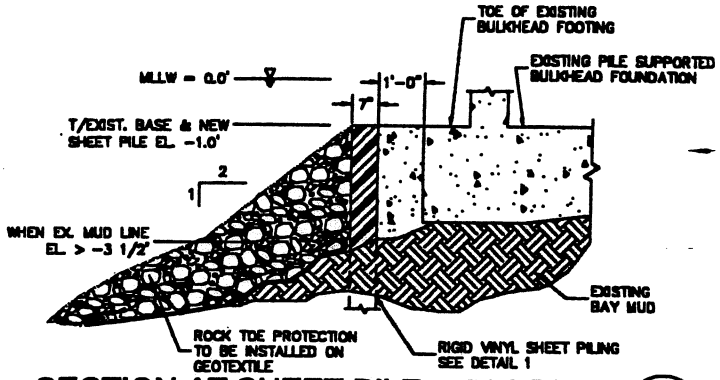
1



SECTION AT WALE: CASE I

SCALE: 1/4" = 1'- 0" (FOUNDATION UNDERMINED)

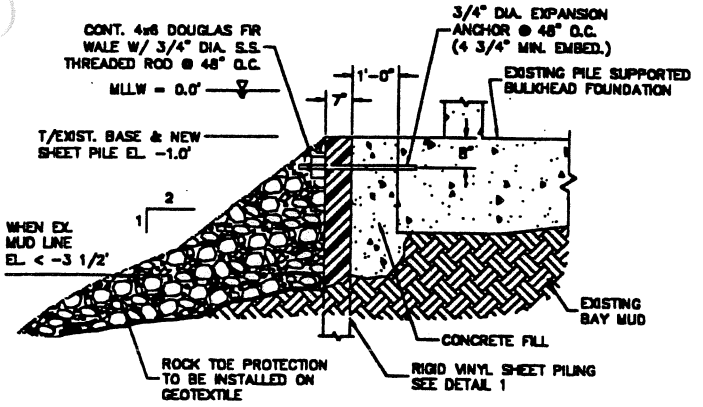
2



SECTION AT SHEET PILE: CASE III

SCALE: 1/4" = 1'- 0" (FOR CANTILEVERED SPANS OF 30" OR LESS SUPPORT WALE NOT REQUIRED)

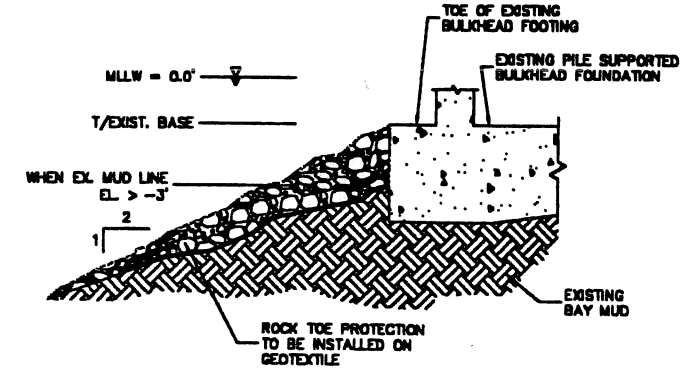
4



SECTION AT WALE: CASE II

SCALE: 1/4" = 1'- 0" (FOR CANTILEVERED SPANS OF 30" OR MORE SUPPORT WALE REQUIRED)

3



SECTION AT SHEET PILE: CASE IV

SCALE: 1/4" = 1'- 0" (RIP-RAP TOE PROTECTION ONLY)

5

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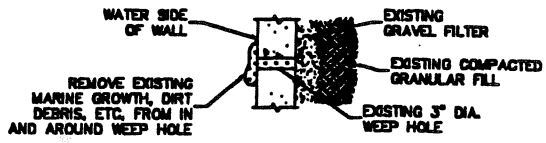
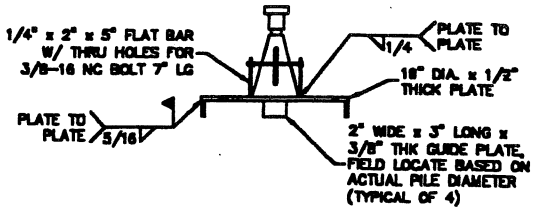
Orange, CA 92868
(714)456-0184, Fax (714)456-0181

PURPOSE: Repair Existing Seawall Datum: MLLW = 0 Adj. Property Owners: 1. See Attached List 2. 3.	SECTION VIEW	Proposed Repair of Existing Seawall ATTACHMENT NO. 8, 24 IN: Huntington Harbour AT: Huntington Beach County of O.C. State: CA Application By: Resident Sheet 6 of 7 Date: 2/25/99



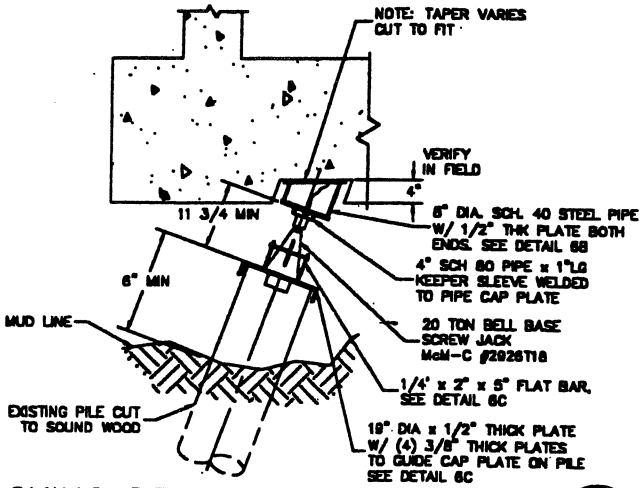
WEEP HOLE DETAIL 6

SCALE: 1/4" = 1'- 0"



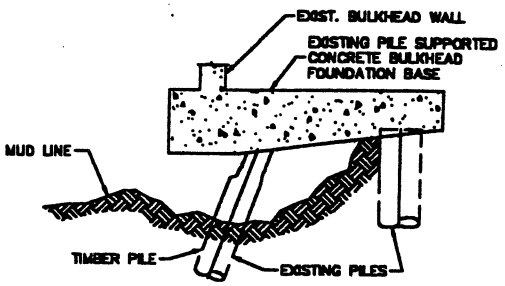
PILE CAP PLATE DETAIL 7C

SCALE: N.T.S.



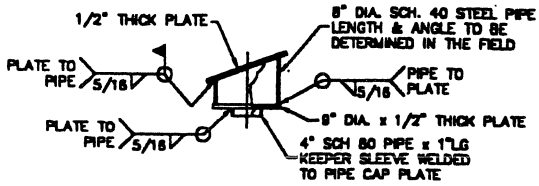
JACKING DETAIL 7

SCALE: 3/4" = 1'- 0"



SECTION 25% OR LESS PILE DETERIORATION 8

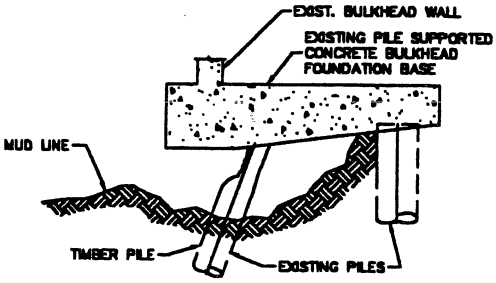
SCALE: N.T.S. PILE REPAIR NOT REQUIRED
SEE DETAIL 2



JACKING ASSEMBLY DETAIL 7B

SCALE: N.T.S.

NOTES: FIELD MEASURE EXISTING PILE SOCKET IN CONCRETE BASE SLAB AND CUT TOP PLATE TO FIT SOCKET.
CENTERLINE TOP PLATE = CENTERLINE PIPE
CENTERLINE PIPE = CENTERLINE JACK



SECTION 25% OR MORE PILE DETERIORATION 9

SCALE: N.T.S. PILE REPAIR REQUIRED
SEE DETAILS: 1 & 2

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(714)456-0186, Fax (714)456-0161

ATTACHMENT NO. 8 of 25

PURPOSE: Repair Existing Seawall Datum: MLLW = 0 Adj. Property Owners: 1. See Attached List 2. 3.	SECTION VIEW	Proposed Repair of Existing Seawall IN: Huntington Harbour AT: Huntington Beach County of O.C. State: CA Application By: Resident Sheet 7 of 7 Date: 2/25/99

APPENDIX B

Area of Impact to Soft Bottom
Humboldt Island & Trinidad Island

ATTACHMENT NO. 1-76

Appendix B. Area of impact to soft bottom habitat and proposed mitigation area, based on calculated area of sheet pile to be placed, Humboldt Island and Trinidad Island, Huntington Beach, California, 2000.

Island	Tract Number	Lot Number	CCC Application Number	Length of Proposed Sheet Pile	Estimated Impact to Soft Bottom			Proposed 2 to 1 Mitigation Area		
				(ft)	(m^2)	(ft^2)	(ha)	(m^2)	(ft^2)	(ha)
Humboldt	5481	126	5-99-008	35	3.4	36.3	0.0003	6.8	72.6	0.0006
Humboldt	5481	129	5-99-008	55	5.3	57.1	0.0005	10.6	114.2	0.0010
Humboldt	5481	130	5-98-443-G	78	7.5	81.0	0.0008	15.0	162.0	0.0016
Humboldt	5481	131	5-98-444-G	60	5.8	62.3	0.0006	11.6	124.6	0.0012
Humboldt	5481	133	5-99-108	50	4.8	51.9	0.0005	9.6	103.8	0.0010
Humboldt	5481	134	5-98-179	50	6.0	64.6	0.0006	12.0	129.2	0.0012
Humboldt	5481	136	5-99-032	50	4.8	51.9	0.0005	9.6	103.8	0.0010
Humboldt	5481	137	5-99-032	50	4.8	51.9	0.0005	9.6	103.8	0.0010
Humboldt	5481	138	5-99-032	50	4.8	51.9	0.0005	9.6	103.8	0.0010
Humboldt	5481	139	5-99-032	50	4.8	51.9	0.0005	9.6	103.8	0.0010
Humboldt	5481	140	5-99-032	50	4.8	51.9	0.0005	9.6	103.8	0.0010
Humboldt	5481	141	5-99-032	50	4.8	51.9	0.0005	9.6	103.8	0.0010
Humboldt	5481	142	5-99-032	50	4.8	51.9	0.0005	9.6	103.8	0.0010
Humboldt	5481	143	5-99-032	50	4.8	51.9	0.0005	9.6	103.8	0.0010
Humboldt	5481	144	5-99-032	50	4.8	51.9	0.0005	9.6	103.8	0.0010
Humboldt	5481	145	5-99-032	50	4.8	51.9	0.0005	9.6	103.8	0.0010
Humboldt	5481	147	5-99-032	21	2.0	21.8	0.0002	4.0	43.6	0.0004
Humboldt	5481	149	5-99-032	60	5.8	62.3	0.0006	11.6	124.6	0.0012
Humboldt	5481	150	5-99-031	65	6.3	67.5	0.0006	12.6	135.0	0.0012
Humboldt	5481	151	5-99-031	75	7.2	77.9	0.0007	14.4	155.8	0.0014
Humboldt	5481	158	5-98-201	95	11.4	122.7	0.0011	22.8	245.4	0.0022
Humboldt	5481	170	5-99-473	18	1.7	18.7	0.0002	3.4	37.4	0.0004
Trinidad	8636	10	Pending	60	4.6	49.8	0.0005	9.2	99.6	0.0010
Trinidad	8636	12	"	42	2.9	31.1	0.0003	5.8	62.2	0.0006
Trinidad	8636	13	"	38	0.1	1.0	0.0000	0.2	2.0	0.0000
Trinidad	8636	23	"	25	2.1	22.8	0.0002	4.2	45.6	0.0004
Trinidad	9168	31	"	16	1.5	16.6	0.0002	3.0	33.2	0.0004
Trinidad	9168	34	"	51	4.9	53.0	0.0005	9.8	106.0	0.0010
Trinidad	9168	41	"	8	0.3	3.1	0.0000	0.6	6.2	0.0000
Trinidad	9168	69	"	15	1.4	15.6	0.0001	2.8	31.2	0.0002
Trinidad	9168	70	"	14	1.3	14.5	0.0001	2.6	29.0	0.0002
Trinidad	9335	44	"	3	0.3	3.1	0.0000	0.6	6.2	0.0000
Trinidad	9335	46	"	6	0.6	6.2	0.0001	1.2	12.4	0.0002
Trinidad	9347	72	"	12	1.2	12.5	0.0001	2.4	25.0	0.0002
Trinidad	9347	73	"	35	2.3	24.9	0.0002	4.6	49.8	0.0004
Trinidad	9347	74	"	67	6	64.4	0.0006	12.0	128.8	0.0012
Trinidad	9347	79	"	10	0.3	3.1	0.0000	0.6	6.2	0.0000
Trinidad	9347	81	"	18	0.7	7.3	0.0001	1.4	14.6	0.0002
Trinidad	9347	82	"	23	1.1	11.4	0.0001	2.2	22.8	0.0002
Total		39	9	1605	146.8	1583.5	0.0148	293.6	3167.0	0.0296

ATTACHMENT NO. 2

APPENDIX C

Calculations for Area of Impact to Soft Bottom
Trinidad Island

ATTACHMENT NO. ~~8.28~~

Appendix C. Estimated impact on soft bottom area and proposed mitigation, based on calculated area of sheet pile to be placed and area of overspilled concrete, Trinidad Island, Huntington Beach, California, 2000.

TRACT-LOT	Frontage Length	Proposed Sheet Pile Length (min)	Proposed Sheet Pile Length (max)	Minimum Estimated Sheet Pile Footprint	Maximum Estimated Sheet Pile Footprint	Length of Overspill in Max. Sheet Pile Zone	Overspill Area in Max. Sheet pile Zone	Actual Impact to Soft Bottom		
	(ft)	(ft)	(ft)	(ft^2)	(ft^2)	(ft)	(ft^2)	(ft^2)	(m^2)	hectares
8636-10	60	12	60	12.5	62.3	12	12.5	49.8	4.63	0.00046
8636-12	60	12	42	12.5	43.6	12	12.5	31.1	2.89	0.00029
8636-13	60	24	38	24.9	39.5	37	38.4	1.0	0.09	0.00001
8636-23	60	25	25	26.0	26.0	3	3.1	22.8	2.12	0.00021
9168-31	162.09	16	16	16.6	16.6	0	0.0	16.6	1.54	0.00015
9168-41	126.76	0	8	0	8.3	5	5.2	3.1	0.29	0.00003
9168-64	126.46	4	51	4.2	53.0	0	0.0	53.0	4.92	0.00049
9168-69	60	15	15	15.6	15.6	0	0.0	15.6	1.45	0.00014
9168-70	60	14	14	14.5	14.5	0	0.0	14.5	1.35	0.00013
9335-44	60	3	3	3.1	3.1	0	0.0	3.1	0.29	0.00003
9335-46	60	6	6	6.2	6.2	0	0.0	6.2	0.58	0.00006
9347-72	76.65	12	12	12.5	12.5	0	0.0	12.5	1.16	0.00012
9347-73	76.65	35	35	36.3	36.3	11	11.4	24.9	2.31	0.00023
9347-74	76.65	67	67	69.6	69.6	5	5.2	64.4	5.98	0.00060
9347-79	59.12	10	10	10.4	10.4	7	7.3	3.1	0.29	0.00003
9347-81	59.12	18	18	18.7	18.7	11	11.4	7.3	0.68	0.00007
9347-82	59.12	23	23	23.9	23.9	12	12.5	11.4	1.06	0.00011
8636-5	60	18	18	18.7	18.7	18	18.7	0	0	0
8636-7	60	17	17	17.7	17.7	17	17.7	0	0	0
8636-9	60	0	6	0	6.2	6	6.2	0	0	0
8636-11	60	0	6	0	6.2	6	6.2	0	0	0
8636-14	60	6	6	6.2	6.2	6	6.2	0	0	0
8636-15	60	24	24	24.9	24.9	24	24.9	0	0	0
8636-16	60	57	57	59.2	59.2	57	59.2	0	0	0
9347-76	60	12	20	12.5	20.8	20	20.8	0	0	0
Total	1782.62	430	597	446.5	619.9	269.0	279.3	340.4	31.62	0.00316

ATTACHMENT NO. 8, 24

APPENDIX D

Photographs of Proposed Mitigation Area

ATTACHMENT NO. 8.30

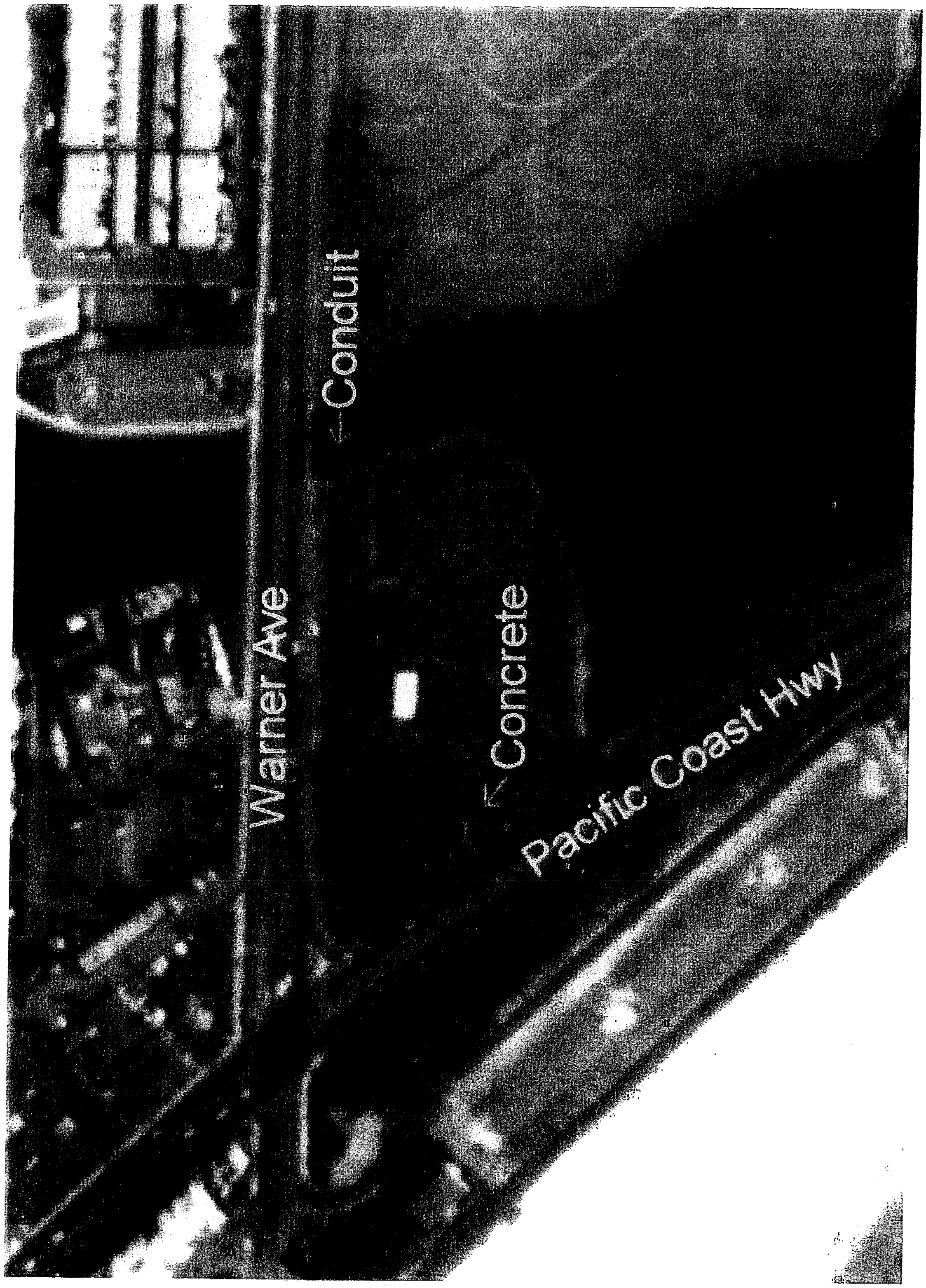

Photo 1. Aerial view of soft bottom mitigation site in Bolsa Chica Ecological Reserve depicting conduit repair location and concrete removal location, Soft Bottom Mitigation Plan, March 2000.

ATTACHMENT NO. 8.31

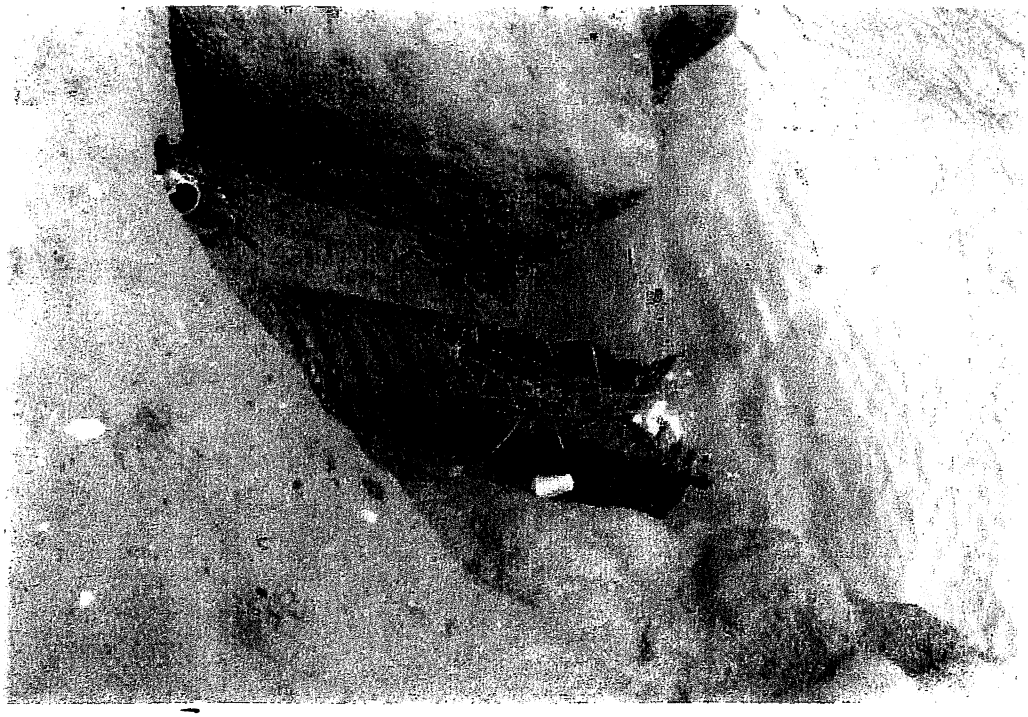

Photo 2. Conduit between channel and wetlands where replacement is proposed.

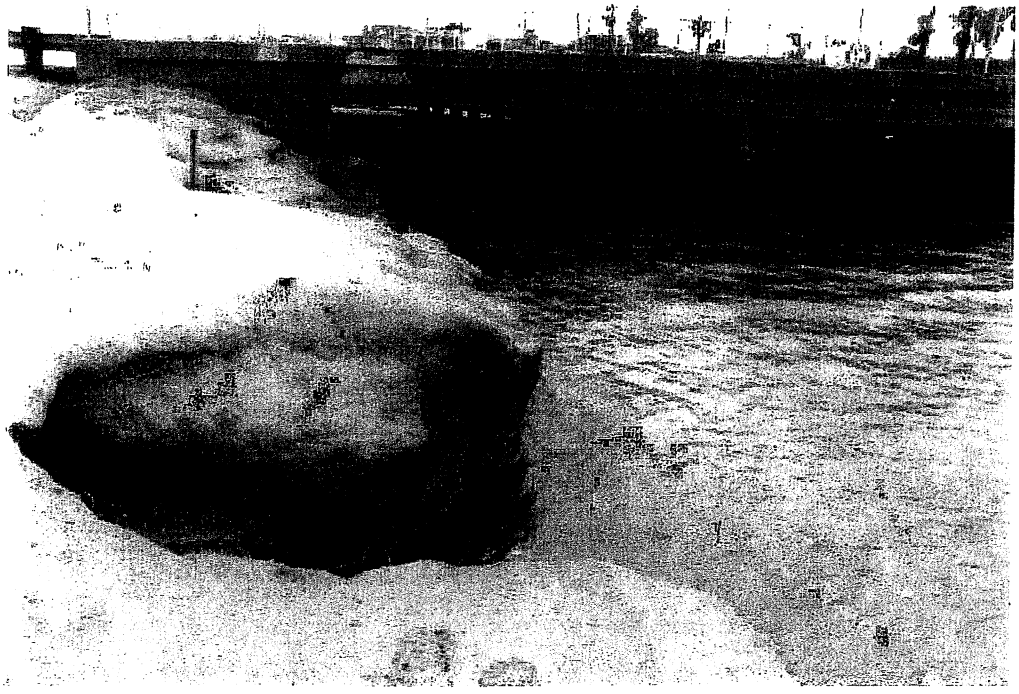

Photo 3. Erosion around conduit at channel where backfill is proposed.

ATTACHMENT NO. 8, 32

Photo 4. Wetland side of conduit between channel and wetlands where replacement is proposed.

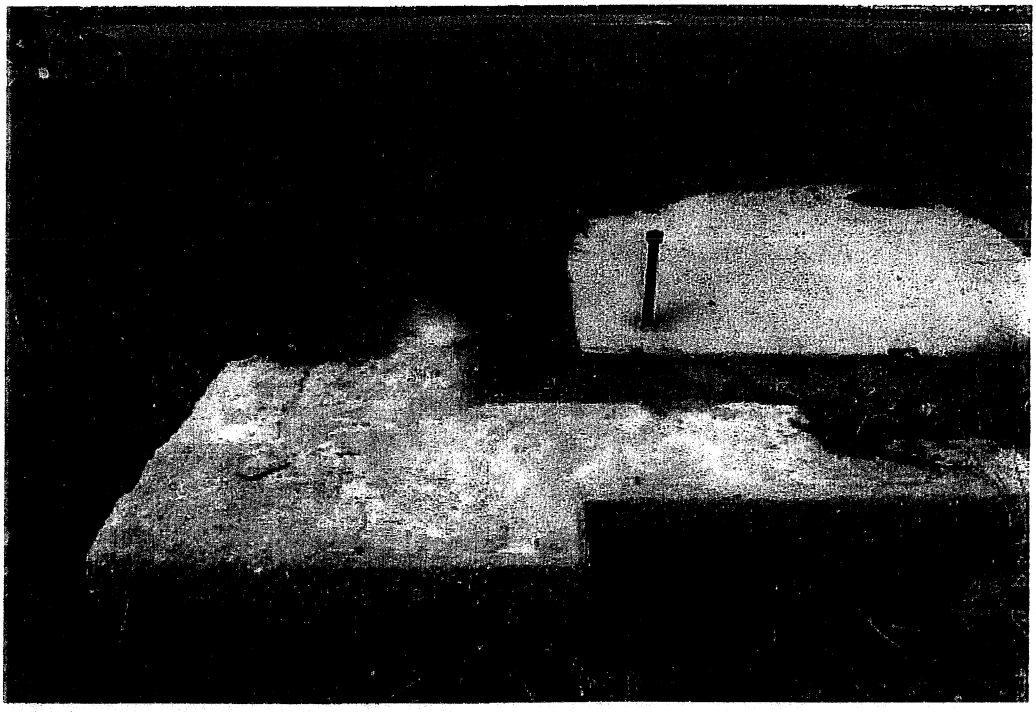

Photo 5. Concrete foundation from former structure located within Bolsa Chica Ecological Reserve (looking west).

ATTACHMENT NO. ~~8.33~~

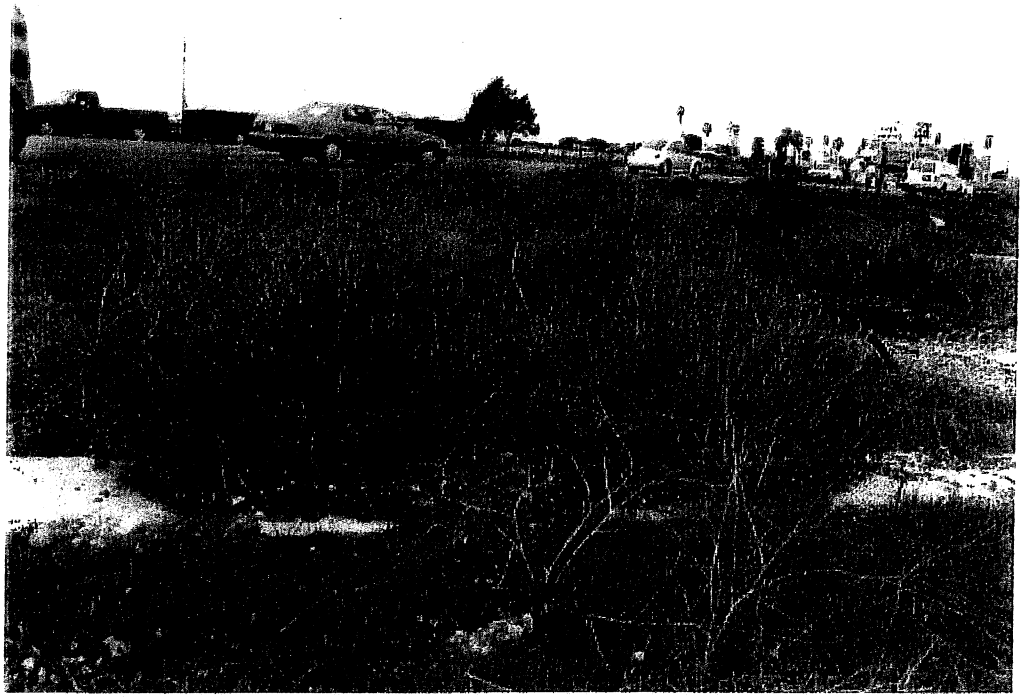

Photo 6. Middle section of concrete foundation looking west.

Photo 7. North section of concrete foundation looking west.

ATTACHMENT NO. 8.34

Photo 8. Area adjacent to concrete where proposed improvements will be conducted (looking northeast).

Photo 9. Area between concrete and functioning wetland where debris is to be removed (looking north).

ATTACHMENT NO. ~~8~~ 3G

ATTACHMENT NO. ~~8~~ 36